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PATENT APPLICATION

ATTORNEY DOCKET NO. 10004159-1

120 AF

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Michael A. Robinson

Serial No.: 09/785,051 **Examiner:** Payne, David C

Filing Date: Feb. 15, 2001 **Group Art Unit:** 2633

Title: FIBER OPTIC RECEIVER WITH AN ADJUSTABLE RESPONSE PREAMPLIFIER

ASSISTANT COMMISSIONER FOR PATENTS
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith in triplicate is the Appeal Brief in this application with respect to the Notice of Appeal filed on **Aug. 11, 2004**.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $320.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( )	one month	$110.00
( )	two months	$410.00
( )	three months	$930.00
( )	four months	$1450.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 50-1078 the sum of **$320.00**. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 50-1078 pursuant to 37 CFR 1.25.

(X) A duplicate copy of this transmittal letter is enclosed.

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I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.
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Typed Name: Edouard Garcia

Signature: _____

Respectfully submitted,

Michael A. Robinson

By _____

Edouard Garcia

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Date: **Oct. 6, 2004**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Michael A. Robinson
Serial No. : 09/785,051
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Art Unit : 2633
Examiner : Payne, David C.

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

I. Real Party in Interest

The real party in interest is Agilent Technologies, Inc., a Delaware corporation having its principal place of business in Palo Alto, California.

II. Related Appeals and Interferences

Appellant is not aware of any related appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-17 and 19-22 are pending.

Claim 18 has been canceled.

Claims 4-7, 9, and 21 have been allowed.

The Examiner has indicated that claims 11, 12, and 22 would be allowed if rewritten in independent form.

CERTIFICATE OF MAILING

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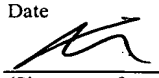

(Signature of person mailing papers)

Edouard Garcia
(Typed or printed name of person mailing papers)

Appellant appeals all rejections of the pending claims 1-3, 8, 10, 13-17, 19 and 20.

IV. Status of Amendments

The amendment filed February 3, 2004, has been entered and acted upon by the Examiner.

No amendments were filed after the final rejection dated April 21, 2004.

V. Summary of Invention

The invention defined in the claims on appeal is exemplified by embodiments of fiber optic receivers that include a receiver optical sub-assembly (ROSA) and a mode selection circuit located outside of the ROSA. The ROSA includes a lens assembly and houses an opto-electronic transducer and an adjustable response preamplifier circuit. The mode selection circuit is configured to transmit a mode control signal to the preamplifier circuit in the ROSA in response to a received control signal. By transmitting the mode control signal from a mode selection circuit located outside of the ROSA, the fiber optic receiver embodiments of the invention allow an adjustable response preamplifier to be incorporated within the ROSA while conforming to the small size and limited pin count constraints of the ROSAs used in many current fiber optic receiver designs. As a result, these fiber optic receiver embodiments may accommodate multiple operating modes (e.g., multiple bandwidth and power modes) while conforming to existing ROSA size and pin count constraints. This feature enables the analog electrical data signals that are generated by the opto-electronic transducer to be amplified, filtered, and shaped optimally for data recovery, while allowing the receiver to be housed within a package that is sized to fit within fiber optic communication devices with significant size constraints.

Claims 1, 2, 8, 13, 14-17, and 19 cover fiber optic receivers that include a receiver optical sub-assembly (ROSA) that houses an opto-electronic transducer and an adjustable response preamplifier circuit, and a mode selection circuit that is located outside of the ROSA. Embodiments within the scope of these claims are described with reference to FIGS. 1-3 at page 5, line 9, through page 7, line 23.

Claim 3 covers fiber optic receivers in which the mode selection circuit is configured to transmit the mode control signal to the preamplifier circuit in response to a received power mode control signal. Embodiments within the scope of claim 3 are described with reference to FIG. 3 at page 8, lines 3-9.

Claim 10 covers fiber optic receivers in which the preamplifier circuit comprises a mode detection circuit that is configured to detect one or more mode control signal pulses based upon a comparison of a common line voltage with a reference voltage. Embodiments within the scope of claim 10 are described with reference to FIG. 6 at page 9, lines 4-22.

Claim 20 covers fiber optic receivers that include an adjustable response preamplifier circuit that is incorporated within a ROSA that is mounted on a substrate, and a post-amplifier circuit that is mounted on the substrate and is configured to transmit a mode control signal to the preamplifier circuit over one or more common lines coupled between the preamplifier circuit and the post-amplifier circuit. Embodiments within the scope of claim 20 are described with reference to FIGS. 1-3 at page 5, line 9, through page 7, line 23, with reference to FIGS. 4, 5A, and 5B at page 8, line 16, through page 9, line 3, and with reference to FIG. 7 at page 9, line 24, through page 11, line 4.

VI. Issues

Sole Issue: Whether claims 1-3, 8, 10, 13-17, 19 and 20 are patentable under 35 U.S.C. § 103(a) over Buescher (US 6,396,351) in view of North (US 6,118,829) and Jiang (US 2002/0076173)?

VII. Grouping of Claims

Claims 1, 2, 8, 13-17, and 19 stand or fall together. Each of claims 3, 10, and 20 stands or falls by itself.

VIII. Argument

Sole Issue: Whether claims 1-3, 8, 10, 13-17, 19 and 20 are patentable under 35 U.S.C. § 103(a) over Buescher (US 6,396,351) in view of North (US 6,118,829) and Jiang (US 2002/0076173)?

The Examiner has rejected claims 1-3, 8, 10, 13-17, 19 and 20 under 35 U.S.C. § 103(a) over Buescher (US 6,396,351) in view of North (US 6,118,829) and Jiang (US 2002/0076173).

A. Claims 1, 2, 8, 13-17, and 19

Claim 1 is an independent claim. Each of claims 2, 8, 13-17, and 19 depends from independent claim 1, which recites:

> Claim 1 (previously presented): A fiber optic receiver, comprising:
>
> a receiver optical sub-assembly (ROSA) comprising a lens assembly, and housing an opto-electronic transducer configured to generate an electrical data signal in response to a received optical data signal and an adjustable response preamplifier circuit electrically coupled to the opto-electronic transducer and operable to amplify an electrical data signal generated by the opto-electronic transducer; and
>
> a mode selection circuit located outside of the ROSA and electrically coupled to an output of the preamplifier circuit and configured to transmit a mode control signal to the preamplifier circuit in response to a received control signal.

1. The Examiner's Rejection Of Claim 1

In his final rejection of independent claim 1, the Examiner has asserted that (emphasis added):

> Buescher disclosed a fiber optic receiver (Figure 2), comprising: an opto-electronic transducer (photodiode not shown at terminal (34), e.g., col./line 3/1-10) configured to generate an electrical data signal in response to a received optical data signal; an adjustable response preamplifier (32) circuit coupled to the opto-electronic transducer and operable to

amplify an electrical data signal generated by the opto-electronic data signal generated by the opto-electronic transducer.

Buescher does not disclose a mode selection circuit coupled to an output of the preamplifier circuit and configured to transmit a mode control signal to the preamplifier circuit in response to a received control signal. However, Buescher does disclose the need for the preamplifier to operate over varying bandwidths (e.g., col./line: 2/40-55). North disclosed a mode selection circuit that operates to adjust the bandwidth response and sensitivity of a communications receiver (e.g., col./line: 4/40-55). It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the North mode selection switch in the Buescher preamplifier circuit to limit bandwidth response to only that required to obtain good pulse fidelity so that less of the background noise spectrum is amplified and the input sensitivity can be kept correspondingly lower as disclosed in North (see col./line 3/25-31).

Buescher does not disclose that the mode selection switch is outside of the sub-assembly. However, it would have been obvious to one of ordinary skill in the art at the time of invention the mode selection switch can be placed outside of the sub-assembly. Making parts separable or changing the position of parts is not patentable over the prior art.

Buescher does not disclose a lens. Jiang disclosed a receiver assembly comprising a lens (121 or 123 of Figure 1, paragraph 0005. However, it would have been obvious to one of ordinary skill in the art at the time of invention to use the Jiang lenses in the Buescher assembly to minimize manufacturing cost as disclosed by Jiang (paragraph 0029)

2. None Of The Cited References Taken Alone Or In Any Permissible Combination Teaches Or Suggests The Inventive Fiber Optic Receiver Recited In Claim 1

None of the cited references individually teaches or suggests a fiber optic receiver that comprises a ROSA that houses an adjustable response preamplifier circuit, and a mode selection circuit that is located outside of the ROSA.

Buescher

Buescher discloses a preamplifier circuit for a photodetector. As acknowledged by the Examiner, Buescher fails to teach anything about a mode selection circuit. Buescher also fails to teach or suggest anything about a receiver that comprises a ROSA comprising a lens

assembly and housing an opto-electronic transducer and an adjustable response preamplifier circuit, much less anything about a receiver that comprises such a ROSA and a mode selection circuit located outside of the ROSA, as recited in claim 1.

North

North discloses two receiver circuit embodiments 200, 450 each of which includes a respective amplifier 210, 454 and a respective mode selection circuit 240, 470 for adjusting the response bandwidth and input sensitivity of the amplifier. North does not teach or suggest anything about a ROSA comprising a lens assembly and housing an opto-electronic transducer and an adjustable response preamplifier circuit, much less anything about a receiver that comprises such a ROSA and mode selection circuit located outside of the ROSA, as recited in claim 1. Indeed, North shows that in each receiver circuit embodiment the mode selection circuit and the amplifier are incorporated in the same circuit. One of ordinary skill in the art at the time of the invention would understand from North's disclosure that the mode selection circuit and the amplifier are formed on the same integrated circuit (IC) die. Thus, North teaches away from a fiber optic receiver having a ROSA housing an adjustable response preamplifier circuit, and a mode selection circuit located outside of the ROSA, as recited in claim 1.

Jiang

Each of Jiang's embodiments includes a ROSA implemented in the form of a TO can package (see, e.g., paragraph [0027]) and an associated lens. In each of these embodiments, however, the TO can package only contains a photodetector. Jiang fails to teach or suggest anything about a ROSA that houses any kind of amplifier circuit, much less anything about a ROSA that houses an adjustable response preamplifier circuit as recited in claim 1. Indeed, Jiang teaches that the preamplifier and postamplifier are integrated on the same receiver integrated circuit chip (see paragraph [0028]) that is mounted outside of the TO can package on the opposite side of the printed circuit board 108 (see FIG. 1).

In sum, none of the cited references individually teaches or suggests a fiber optic receiver that comprises a ROSA that houses an adjustable response preamplifier circuit, and a mode selection circuit that is located outside of the ROSA. Therefore, no permissible combination of the cited references could possibly have led one of ordinary skill in the art at the time of the invention to the inventive fiber optic receiver recited in claim 1. For at least

these reasons, the Examiner's rejection of claim 1 under 35 U.S.C. § 103(a) should be withdrawn.

3. The Examiner Has Failed To Establish A Proper *Prima Facie* Case Of Obviousness

MPEP § 2143.03 requires that (emphasis added):

> To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

In his rejection of independent claim 1, however, the Examiner has failed to find in the cited references a teaching or suggestion of all the claim limitations recited in claim 1. In particular, the Examiner has failed to point to any teaching in any of the cited references of a fiber optic receiver that comprises: (1) a ROSA that comprises a lens assembly and houses an opto-electronic transducer and an adjustable response preamplifier circuit; and (2) a mode selection circuit that is located outside of the ROSA.

Instead of adhering to a proper standard for establishing a *prima facie* case of obviousness, the Examiner has merely argued that "making parts separable or changing the placement of parts is not considered patentable over the prior art." While it may be easier for the Examiner to simply sweep inconvenient claim limitations into the "separable parts" category or the "changed placement of parts" category and then reject a claim on this basis alone, such an approach is improper because it invites the Examiner to substitute an undisciplined and superficial assessment of the "gist" of a claim for a proper, rigorous analysis of the claim language. For this reason, the MPEP prohibits the Examiner from rejecting a claim in this way. For example, regarding the "rearrangement of parts" doctrine, the MPEP § 2144.04 IV.C explains that the Examiner cannot merely invoke the doctrine without finding in the cited references the requisite motivation or reason for one skilled in the art to arrive at the arrangement of features recited in the claims (emphasis added):

> "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's

> specification, to make the necessary changes in the reference device." Ex parte Chicago Rawhide Mfg. Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).

Thus, the Examiner is prohibited from resting his obviousness rejection entirely on the unsubstantiated assertion that "it would have been obvious to one of ordinary skill in the art at the time of invention [that] the mode selection switch can be placed outside the sub-assembly" based solely on the assertion that "[m]aking parts separable or changing the position of parts is not patentable over the prior art."

In addition, the Examiner has improperly mischaracterized the features recited in claim 1 as merely "making parts separable or changing the placement of parts". Claim 1 explicitly recites a particular non-obvious arrangement of (a) a ROSA, (b) a lens assembly, (c) an opto-electronic transducer, (d) an adjustable response preamplifier circuit, and (e) a mode selection circuit that achieves specific tangible advantages that are not achievable by prior fiber optic receiver designs. In particular, this non-obvious arrangement of elements allows an adjustable response preamplifier to be incorporated within a ROSA having a small size and a limited pin count. As a result, the fiber optic receiver recited in claim 1 may accommodate multiple operating modes (e.g., multiple bandwidth and power modes) while conforming to existing ROSA size and pin count constraints. This feature enables the analog electrical data signals generated by the opto-electronic transducer to be amplified, filtered, and shaped optimally for data recovery, while allowing the receiver to be housed within a package sized to fit within fiber optic communication devices with significant size constraints.

Thus, contrary to the Examiner's assertion, the inventive contribution of the fiber optic receiver recited in independent claim 1 is not "making parts separable or changing the placement of parts," but rather the non-obvious arrangement of elements that achieves the specific, tangible advantages described in the preceding paragraph.

To summarize, the Examiner has failed to point to any teaching or suggestion in any of the cited references that would have led one of ordinary skill in the art to a fiber optic receiver that comprises: (1) a ROSA that comprises a lens assembly and houses an opto-electronic transducer and an adjustable response preamplifier circuit; and (2) a mode selection circuit that is located outside of the ROSA. Consequently, the Examiner has failed to establish a proper *prima facie* case of obviousness. For at least this additional reason, the

Examiner's rejection of independent claim 1 under 35 U.S.C. § 103(a) over Buescher in view of North and Jiang should be withdrawn.

4. Conclusion

For the reasons explained above, none of the cited references taken alone or in any permissible combination teaches or suggests the inventive fiber optic receiver recited in claim 1. In addition, the Examiner has failed to establish a proper *prima facie* case of obviousness because the Examiner has improperly mischaracterized certain features recited in claim 1 as merely "making parts separable or changing the placement of parts" and, on this basis alone, the Examiner has asserted that such features would have been obvious to one of ordinary skill in the art at the time of invention.

Each of claims 2, 8, 13-17, and 19 incorporates the features of independent claim 1 and therefore is patentable for at least the same reasons explained above.

B. Claim 3

Claim 3 depends from independent claim 1 and therefore is patentable over the cited references for the same reasons explained above. Claim 3 also is patentable over the cited references for the following additional reasons.

Claim 3 recites:

> Claim 3 (Original): The fiber optic receiver of claim 1, wherein the mode selection circuit is configured to transmit the mode control signal to the preamplifier circuit in response to a received power mode control signal.

In his final rejection of claim 3, the Examiner has asserted that:

> the modified invention of Buescher and North disclosed the mode selection circuit is configured to transmit the mode control signal to the preamplifier circuit in response to a received power mode control signal (North e.g., col./line: 11/1-20).

Contrary to the Examiner's assertion, however, North does not disclose a mode selection circuit that transmits a mode control signal to the preamplifier in response to a received power mode control signal. Instead, the mode selection circuits disclosed in North

transmit a high-speed mode control signal in response to a high-speed data signal and a low-speed mode control signal in response to a low-speed data signal (see, e.g., col. 5, lines 44-52, col. 6, lines 11-19, and col. 7, lines 41-57). That is, North's mode selection circuits are responsive to the speed of data signals; they are not responsive to a power mode control signal.

In addition, North does not teach or suggest anything that would have led one of ordinary skill in the art at the time the invention was made to input a power mode control signal into North's mode selection circuits 240, 470. Indeed, North does not even hint that his mode selection circuits 240, 470 could be used to control the operating power parameters of the input amplifier circuits 210, 454. Rather, North teaches that the mode selection circuits 240, 470 are used only to adjust the bandwidth of the input amplifier 210 or to adjust the input sensitivity of the input amplifier 454 based on the speed of the received data signal.

For at least these additional reasons, the Examiner's rejection of claim 3 under 35 U.S.C. § 103(a) over Buescher in view of North and Jiang should be withdrawn.

C. Claim 10

Claim 10 depends from independent claim 1 and therefore is patentable over the cited references for the same reasons explained above. Claim 10 also is patentable over the cited references for the following additional reasons.

Claim 10 depends from claim 8, which recites:

> Claim 8 (Original): The fiber optic receiver of claim 1, wherein the preamplifier circuit comprises a mode detection circuit configured to generate a response control signal for adjusting the response of the preamplifier circuit based upon the mode control signal transmitted by the mode selection circuit.

Claim 10 recites:

> Claim 10 (previously presented): The fiber optic receiver of claim 8, wherein the mode detection circuit is configured to detect the one or more mode control signal pulses based upon a comparison of a common line voltage with a reference voltage.

In his final rejection of claim 10, the Examiner has asserted that:

> the modified invention of Buescher and North disclosed wherein the mode detection circuit is configured to detect the one or more mode control signal pulses based upon a comparison of a common line voltage with a reference voltage (North, e.g., col./line: 8/50-60).

Contrary to the Examiner's assertion, however, North does not disclose a preamplifier circuit that comprises a mode detection circuit that is configured to detect one or more mode control signal pulses based upon a comparison of a common line voltage with a reference voltage.

The Examiner has asserted that the switch 230 corresponds to the mode detection circuit recited in claim 10. The switch 230, however, merely selectively connects the capacitor 222 to ground in response to the MODE signal received from the mode selection circuit 240. The switch 230 is not configured to generate a response control signal and therefore cannot reasonably be considered to correspond to the mode detection circuit recited in claim 10. Rather,

In the second receiver embodiment shown in FIG. 4 of North, the AGC control circuit 456 cannot reasonably be considered to correspond to the mode detection circuit recited in claim 10 because it is not configured to detect one or more mode control signal pulses based upon a comparison of a common line voltage with a reference voltage.

For at least these additional reasons, the Examiner's rejection of claim 10 under 35 U.S.C. § 103(a) over Buescher in view of North and Jiang should be withdrawn.

D. Claim 20

Claim 20 is an independent claim that recites:

> Claim 20 (Original): A fiber optic receiver, comprising:
>
> a substrate;
>
> a receiver optical sub-assembly (ROSA) mounted on the substrate and comprising a fiber optic connector for coupling to a mating connector of a fiber optic cable;
>
> an opto-electronic transducer incorporated within the ROSA and configured to generate an electrical data signal in response to a received optical data signal;
>
> an adjustable response preamplifier circuit incorporated within the ROSA, coupled to the opto-electronic transducer,

and operable to amplify an electrical data signal generated by the opto-electronic transducer; and

a post-amplifier circuit mounted on the substrate, coupled to an output of the preamplifier circuit, and configured to transmit a mode control signal to the preamplifier circuit over one or more common lines coupled between the preamplifier circuit and the post-amplifier circuit in response to a received data rate control signal.

1. The Examiner's Rejection Of Claim 20

In his final rejection of independent claim 20, the Examiner has asserted that (emphasis added):

> Regarding claims 17-20,
>
> Buescher disclosed an adjustable response preamplifier circuit, coupled to the opto-electronic transducer (Figure 2 (32)), and operable to amplify an electrical data signal generated by the optoelectronic transducer (photodiode not shown at terminal (34), e.g., col./line: 3/1-10); and a postamplifier circuit (44).
>
> Buescher does not disclose a mode control signal connected to the preamplifier adjusted in response to a received data rate control signal. However, Buescher does disclose the need for the preamplifier to operate over varying bandwidths (e.g., col./line: 2/40-55). North disclosed a mode selection circuit that operates to adjust the bandwidth response and sensitivity of a communications receiver (e.g., col./line: 4/40-55). It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the North mode selection switch in the Buescher preamplifier circuit to limit bandwidth response to only that required to obtain good pulse fidelity so that less of the background noise spectrum is amplified and the input sensitivity can be kept correspondingly lower as disclosed by North (see col./line: 3/25-31).
>
> Buescher does not disclose integrating a connector along with these components on a substrate. Jiang disclosed integrating a preamplifier, postamplifier, receiver and connector on a common substrate (PCB), e.g., col./line: p1. paragraph 0002, p2. paragraph 0028, p3. paragraph 0030. It would have been obvious to one of ordinary skill in the art at the time of invention to integrate the components as did Jiang for the benefit improved connectivity in a small footprint as disclosed by Jiang see p1. paragraph 0004.

2. None Of The Cited References Taken Alone Or In Any Permissible Combination Teaches Or Suggests The Inventive Fiber Optic Receiver Recited In Claim 20

a. None Of The Cited References Teaches Or Suggests A Fiber Optic Receiver That Comprises A Rosa Incorporating An Adjustable Response Preamplifier Circuit, And A Post-Amplifier Circuit Mounted On A Substrate On Which The Rosa Is Mounted

Buescher

Buescher discloses a preamplifier circuit for a photodetector. As acknowledged by the Examiner, Buescher fails to teach anything about a post-amplifier circuit configured to transmit a mode control signal to the preamplifier circuit. Buescher also fails to teach or suggest anything about a receiver that comprises a ROSA comprising a fiber optic connector, an opto-electronic transducer, and an adjustable response preamplifier circuit, much less anything about a receiver that comprises such a ROSA and a post-amplifier circuit mounted on a substrate on which the ROSA is mounted, as recited in claim 1.

North

North discloses two receiver circuit embodiments 200, 450 each of which includes a respective amplifier 210, 454 and a respective mode selection circuit 240, 470 for adjusting the response bandwidth and input sensitivity of the amplifier. North does not teach or suggest anything about a ROSA comprising a fiber optic connector, an opto-electronic transducer, and an adjustable response preamplifier circuit, much less anything about a receiver that comprises such a ROSA and post-amplifier circuit mounted on a substrate on which the ROSA is mounted, as recited in claim 1. Indeed, North shows that in each receiver circuit embodiment the circuit that generates the mode control signal and the amplifier are incorporated in the same circuit. One of ordinary skill in the art at the time of the invention would understand from North's disclosure that the circuit that generates the mode control signal and the amplifier are formed on the same integrated circuit (IC) die. Thus, North teaches away from a fiber optic receiver having a ROSA incorporating an adjustable response preamplifier circuit, and a post-amplifier circuit mounted on a substrate on which the ROSA is mounted, as recited in claim 1.

Jiang

The Examiner has cited Jiang for the proposition that "Jiang disclosed integrating a preamplifier, postamplifier, receiver and connector on a common substrate (PCB)." Each of Jiang's embodiments includes a ROSA that is implemented in the form of a TO can package

(see, e.g., paragraph [0027]) and an associated lens. In each of these embodiments, however, the TO can package only contains a photodetector. Jiang fails to teach or suggest anything about a ROSA that incorporates any kind of amplifier circuit, much less anything about a ROSA that incorporates an adjustable response preamplifier circuit as recited in claim 1. Indeed, Jiang teaches that the preamplifier and postamplifier are incorporated into the same receiver integrated circuit chip (see paragraph [0028]) that is mounted outside of the TO can package on the opposite side of the printed circuit board 108 (see FIG. 1).

Since none of the cited references teaches or suggests a fiber optic receiver that comprises a ROSA incorporating an adjustable response preamplifier circuit, and a post-amplifier circuit mounted on a substrate on which the ROSA is mounted, no permissible combination of the cited references could possibly have led one of ordinary skill in the art at the time of the invention to the inventive fiber optic receiver recited in claim 20.

b. None Of The Cited References Teaches Or Suggests A Post-Amplifier Circuit That Is Configured To Transmit A Mode Control Signal Over One Or More Common Lines Coupled Between The Preamplifier Circuit And The Post-Amplifier Circuit

Buescher

As acknowledged by the Examiner, Buescher fails to teach anything about a post-amplifier circuit that is configured to transmit a mode control signal to a preamplifier circuit of a fiber optic receiver.

North

In the final Office action dated April 21, 2004, the Examiner indicated that North teaches a mode selection circuit that is configured to modulate a mode control signal onto a common line coupled between a preamplifier circuit and a post-amplifier circuit. In each of North's embodiments, however, the mode control signal (labeled "MODE" in FIGS. 2 and 4) is not modulated onto a line coupled between a preamplifier circuit and a post-amplifier circuit.

In the embodiment of FIG. 2, the only line coupled between the amplifier 210 and the comparator amplifier 220 is the line labeled I_{OUT}. In this embodiment, the MODE signal is not transmitted over the I_{OUT} line. Rather, this MODE signal is transmitted over a line connected to switch 230 and a line connected to variable voltage reference 214. Neither of these lines is coupled between the amplifier 210 and the comparator amplifier 220.

Similarly, in the embodiment of FIG. 4, the only line coupled between the amplifier 454 and the comparator amplifier 458 is the line labeled V_{OUT}. In this embodiment, the MODE signal is not transmitted over the I_{OUT} line. Rather, this MODE signal is transmitted over a line connected to the AGC control circuit 456, which is not coupled between the amplifier 210 and the comparator amplifier 220.

Jiang

Jiang fails to teach anything about a post-amplifier circuit that is configured to transmit a mode control signal to a preamplifier circuit of a fiber optic receiver.

3. The Examiner Has Failed To Establish A Proper *Prima Facie* Case Of Obviousness

MPEP § 2143.03 requires that (emphasis added):

> To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

In his rejection of independent claim 20, however, the Examiner has failed to find in the cited references a teaching or suggestion of all the claim limitations recited in claim 20. In particular, the Examiner has failed to point to any teaching in any of the cited references of a fiber optic receiver that comprises a post-amplifier circuit that is configured to transmit a mode control signal over one or more common lines coupled between the preamplifier circuit and the post-amplifier circuit.

For at least this additional reason, the Examiner's rejection of claim 20 under 35 U.S.C. § 103(a) over Buescher in view of North and Jiang should be withdrawn.

4. Conclusion

In sum, none of the cited references individually teaches or suggests a fiber optic receiver that comprises a ROSA incorporating an adjustable response preamplifier circuit, and a post-amplifier circuit that is mounted on a substrate on which the ROSA is mounted, nor do any of the cited references teach or suggest a post-amplifier circuit that is configured to modulate the mode control signal onto at least one common line coupled between the preamplifier circuit and the post-amplifier circuit. Therefore, no permissible combination of

the cited references could possibly have led one of ordinary skill in the art at the time of the invention to the inventive fiber optic receiver now recited in claim 20.

For at least these reasons, the Examiner's rejection of claim 20 under 35 U.S.C. § 103(a) over Buescher in view of North and Jiang should be withdrawn.

IX. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 50-1078.

Respectfully submitted,

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APPENDIX

The claims that are the subject of Appeal are presented below.

Claim 1 (previously presented): A fiber optic receiver, comprising:

a receiver optical sub-assembly (ROSA) comprising a lens assembly, and housing an opto-electronic transducer configured to generate an electrical data signal in response to a received optical data signal and an adjustable response preamplifier circuit electrically coupled to the opto-electronic transducer and operable to amplify an electrical data signal generated by the opto-electronic transducer; and

a mode selection circuit located outside of the ROSA and electrically coupled to an output of the preamplifier circuit and configured to transmit a mode control signal to the preamplifier circuit in response to a received control signal.

Claim 2 (Original): The fiber optic receiver of claim 1, wherein the mode selection circuit is configured to transmit the mode control signal to the preamplifier circuit in response to a received data rate control signal.

Claim 3 (Original): The fiber optic receiver of claim 1, wherein the mode selection circuit is configured to transmit the mode control signal to the preamplifier circuit in response to a received power mode control signal.

Claim 4 (allowed): A fiber optic receiver, comprising:

an opto-electronic transducer configured to generate an electrical data signal in response to a received optical data signal;

an adjustable response preamplifier circuit electrically coupled to the opto-electronic transducer and operable to amplify an electrical data signal generated by the opto-electronic transducer;

a post-amplifier circuit electrically coupled to the preamplifier circuit; and

a mode selection circuit electrically coupled to an output of the preamplifier circuit and configured to transmit a mode control signal to the preamplifier circuit in response to a received control signal, wherein the mode selection circuit is configured to modulate the mode control signal onto at least one common line coupled between the preamplifier circuit and the post-amplifier circuit.

Claim 5 (allowed): The fiber optic receiver of claim 4, wherein the mode selection circuit is configured to modulate the mode control signal onto the at least one common line as a single pulse.

Claim 6 (allowed): The fiber optic receiver of claim 4, wherein the mode selection circuit is configured to modulate the mode control signal onto the at least one common line as a multiple pulse pattern.

Claim 7 (allowed): The fiber optic receiver of claim 4, wherein the mode selection circuit is configured to modulate the mode control signal onto the at least one common line as a time-varying signal.

Claim 8 (Original): The fiber optic receiver of claim 1, wherein the preamplifier circuit comprises a mode detection circuit configured to generate a response control signal for adjusting the response of the preamplifier circuit based upon the mode control signal transmitted by the mode selection circuit.

Claim 9 (allowed): The fiber optic receiver of claim 4, further comprising a mode detection circuit configured to generate a response control signal for adjusting the response of the preamplifier circuit based upon the mode control signal transmitted by the mode selection circuit, wherein the mode detection circuit is configured to detect one or more mode control signal pulses modulated onto the at least one common line onto which the mode control signal is modulated.

Claim 10 (previously presented): The fiber optic receiver of claim 8, wherein the mode detection circuit is configured to detect the one or more mode control signal pulses based upon a comparison of a common line voltage with a reference voltage.

Claim 11 (Original): The fiber optic receiver of claim 8, wherein the mode detection circuit is configured to detect a time-varying mode control signal modulated onto a common line coupled between the preamplifier circuit and the mode selection circuit.

Claim 12 (Original): The fiber optic receiver of claim 11, wherein the mode detection circuit comprises a frequency detector.

Claim 13 (Original): The fiber optic receiver of claim 1, wherein the preamplifier circuit is configured to select one of multiple sets of operating parameters based upon the mode control signal transmitted by the mode selection circuit.

Claim 14 (Original): The fiber optic receiver of claim 13, wherein the preamplifier circuit is configured to adjust one or more bandwidth response parameters in response to a bandwidth mode control signal transmitted by the mode selection circuit.

Claim 15 (Original): The fiber optic receiver of claim 13, wherein the preamplifier circuit is configured to adjust one or more supply current operating parameters in response to a power mode control signal transmitted by the mode selection circuit.

Claim 16 (Original): The fiber optic receiver of claim 1, wherein the mode selection circuit is incorporated within a post-amplifier circuit.

Claim 17 (previously presented): The fiber optic receiver of claim 1, wherein the ROSA comprises a fiber optic connector for coupling to a mating connector of a fiber optic cable.

Claim 18 (Canceled)

Claim 19 (previously presented): The fiber optic receiver of claim 1, wherein the ROSA and the post-amplifier circuit are mounted on a common substrate.

Claim 20 (Original): A fiber optic receiver, comprising:

a substrate;

a receiver optical sub-assembly (ROSA) mounted on the substrate and comprising a fiber optic connector for coupling to a mating connector of a fiber optic cable;

an opto-electronic transducer incorporated within the ROSA and configured to generate an electrical data signal in response to a received optical data signal;

an adjustable response preamplifier circuit incorporated within the ROSA, coupled to the opto-electronic transducer, and operable to amplify an electrical data signal generated by the opto-electronic transducer; and

a post-amplifier circuit mounted on the substrate, coupled to an output of the preamplifier circuit, and configured to transmit a mode control signal to the preamplifier circuit over one or more common lines coupled between the preamplifier circuit and the post-amplifier circuit in response to a received data rate control signal.

Claim 21 (allowed): The fiber optic receiver of claim 4, wherein at least one common line onto which the mode control signal is modulated is a line selected from: a data signal line and a power line.

Claim 22 (previously presented): The fiber optic receiver of claim 20, wherein at least one common line onto which the mode control signal is modulated is a line selected from: a data signal line and a power line.